

**60th Medical Group (AMC), Travis AFB, CA**  
**INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)**  
**FINAL REPORT SUMMARY**

(Please type all information. Use additional pages if necessary.)

PROTOCOL #: FDG20160025A

DATE: 13 June 2017

PROTOCOL TITLE: Microsurgical versus Conventional Skin Closure in the Laboratory Rat (*Rattus norvegicus*).

PRINCIPAL INVESTIGATOR (PI) / TRAINING COORDINATOR (TC): Dr. Fawn Hogan

DEPARTMENT: Plastic Surgery

PHONE #: 707-423-5224

INITIAL APPROVAL DATE: 30 August 2016

LAST TRIENNIAL REVISION DATE: N/A

FUNDING SOURCE: SG

1. **RECORD OF ANIMAL USAGE:**

Animal Species:	Total # Approved	# Used this FY	Total # Used to Date
<i>Rattus norvegicus</i>	51	40	40

2. **PROTOCOL TYPE / CHARACTERISTICS:** (Check all applicable terms in **EACH** column)

<input type="checkbox"/> Training: Live Animal	<input type="checkbox"/> Medical Readiness	<input type="checkbox"/> Prolonged Restraint
<input type="checkbox"/> Training: non-Live Animal	<input type="checkbox"/> Health Promotion	<input type="checkbox"/> Multiple Survival Surgery
<input type="checkbox"/> Research: Survival (chronic)	<input type="checkbox"/> Prevention	<input type="checkbox"/> Behavioral Study
<input checked="" type="checkbox"/> Research: non-Survival (acute)	<input type="checkbox"/> Utilization Mgt.	<input type="checkbox"/> Adjuvant Use
<input type="checkbox"/> Other (                      )	<input type="checkbox"/> Other (Treatment    )	<input type="checkbox"/> Biohazard

3. **PROTOCOL PAIN CATEGORY (USDA):** (Check applicable)    ☐ C    ☒ D    ☐ E

4. **PROTOCOL STATUS:**

**\*Request Protocol Closure:**

☐ Inactive, protocol never initiated

☐ Inactive, protocol initiated but has not/will not be completed

☒ Completed, all approved procedures/animal uses have been completed

5. **Previous Amendments:**

List all amendments made to the protocol.. IF none occurred, state **NONE**. Do not use N/A.

**For the Entire Study Chronologically**

Amendment Number	Date of Approval	Summary of the Change
None		

6. **FUNDING STATUS:** Funding allocated: \$12,254

Funds remaining: \$ 0

7. **PROTOCOL PERSONNEL CHANGES:**

Have there been any personnel/staffing changes (PI/CI/AI/TC/Instructor) since the last IACUC approval of protocol, or annual review? ☐ Yes ☒ No

If yes, complete the following sections (Additions/Deletions). For additions, indicate whether or not the IACUC has approved this addition.

**ADDITIONS:** (Include Name, Protocol function - PI/CI/AI/TC/Instructor, IACUC approval - Yes/No)

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**DELETIONS:** (Include Name, Protocol function - PI/CI/AI/TC/Instructor, Effective date of deletion)

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8. **PROBLEMS / ADVERSE EVENTS:** Identify any problems or adverse events that have affected study progress. Itemize adverse events that have led to unanticipated animal illness, distress, injury, or death; and indicate whether or not these events were reported to the IACUC.

No problems or adverse events were identified.

9. **REDUCTION, REFINEMENT, OR REPLACEMENT OF ANIMAL USE:**

**REPLACEMENT (ALTERNATIVES):** Since the last IACUC approval, have alternatives to animal use become available that could be substituted in this protocol without adversely affecting study or training objectives?

No.

**REFINEMENT:** Since the last IACUC approval, have any study refinements been implemented to reduce the degree of pain or distress experienced by study animals, or have animals of lower phylogenetic status or sentience been identified as potential study/training models in this protocol?

No.

**REDUCTION:** Since the last IACUC approval, have any methods been identified to reduce the number of live animals used in this protocol?

Our pilot study used less than the allotted number of rats.

10. **PUBLICATIONS / PRESENTATIONS:** (List any scientific publications and/or presentations that have resulted from this protocol. Include pending/scheduled publications or presentations).

Currently, the DGMC Research Symposium.

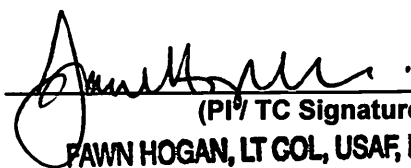
11. **Were the protocol objectives met, and how will the outcome or training benefit the DoD/USAF?**

Yes. The outcome will hopefully further delineate whether the use of surgical loupes or surgical microscope will result in improved wound closure.

12. **PROTOCOL OUTCOME SUMMARY:** (Please provide, in "ABSTRACT" format, a summary of the protocol objectives, materials and methods, results - include tables/figures, and conclusions/applications.)

Obtaining a cosmetically acceptable scar depends on various factors such as wound tension, alignment of the wound edges, and proper wound eversion. Suture size and strength also play an important role in wound healing and have been studied widely. However, no studies exist which examine the effects of closure method on scar formation. Our purpose in this study was to compare the cosmetic outcome, healing and strength of linear incisions in rats after repair with naked eye, surgical loupes or a surgical microscope. We surgically created two, parallel, 3 cm long linear incisions on the dorsal skin of male Sprague Dawley rats (n=36) and randomized the incisions into four groups. A single surgeon repaired the incisions with the naked eye in group I, surgical loupes in group II,

microscope in group III using 5/0 monocryl, and with microscope in group IV using 6/0 monocryl. Wound strength was measured using a published method. A harvested incision was suspended with forceps and water was slowly added to a freely suspended container until any tears of the incision occurred. The force necessary to achieve dehiscence was recorded. Wound healing was evaluated histologically using published methods to examine vascularization, fibroblast proliferation, inflammation and epithelialization. Statistical analysis between groups using ANOVA testing was performed and significance was defined as  $p < 0.05$ . Initial results were not significant for wound tensile strength, vascularity, fibroblast proliferation, inflammatory cells or epithelialization between all groups at 1, 3 and 6 weeks. Our initial conclusion is there is no difference in scar healing in wounds sutured with surgical loupes or surgical microscope versus traditional techniques using the naked eye.

  
(PI/ TC Signature)  
FAWN HOGAN, LT COL, USAF, MC  
045S3G, PLASTIC SURGEON  
60 SGCS/SGCQG

14 June 17  
(Date)

80 2GCS12GCG  
04523G, PLASTIC SURGEON  
FAWN HOGAN, LT COL, USAF, MC



**Attachments:**

Attachment 1: Defense Technical Information Center (DTIC) Abstract Submission **(Mandatory)**

**Attachment 1****Defense Technical Information Center (DTIC) Abstract Submission**

**This abstract requires a brief (no more than 200 words) factual summary of the most significant information in the following format: Objectives, Methods, Results, and Conclusion.**

**Objectives:** To compare the cosmetic outcome, healing and strength of linear incisions in rats after repair with naked eye, surgical loupes or a surgical microscope.

**Methods:** A single surgeon created two, parallel, 3 cm long linear incisions on the dorsal skin of male Sprague Dawley rats (n=36) and randomized the incisions into four groups. The incisions were repaired with the naked eye, surgical loupes, microscope using 5/0 monocril, and microscope using 6/0 monocril. Wound strength was measured using a published method. A harvested incision was suspended with forceps and water was slowly added to a freely suspended container until any tears of the incision occurred. The force necessary to achieve dehiscence was recorded. Wound healing was evaluated histologically using published methods to examine vascularization, fibroblast proliferation, inflammation and epithelialization.

**Results:** Statistical analysis between groups using ANOVA testing was performed and significance was defined as  $p < 0.05$ . Initial results were not significant for wound tensile strength, vascularity, fibroblast proliferation, inflammatory cells or epithelialization between all groups at 1, 3 and 6 weeks.

**Conclusion:** Our initial conclusion is there is no difference in scar healing in wounds sutured with surgical loupes or surgical microscope versus traditional techniques using the naked eye.

**Grant Number:** \_\_\_\_\_

**From:** \_\_\_\_\_

**\*\*If you utilized an external grant, please provide Grant # and where the grant came from. Thank you.**